

Claims

What is claimed is:

1. A method for estimating carrier frequency offset in subscriber terminals, said method comprises steps:
 - A. determining number of effective base stations from which more than one signals are received by a subscriber terminal and main path positions of each signal;
 - B. combining the signals of each station corresponding to said number of effective base stations based on the main path positions obtained in step A;
 - C. calculating a rough estimation value of the carrier frequency offset based on combined signal in step B.
2. A method as claimed in claim 1, wherein said determining number of effective base stations from which more than one signals are received by a subscriber terminal in step A comprises steps:
 - A1. calculating peak power value of each signal received by a subscriber terminal, and selecting the peak power values of predefined number of base stations from higher to lower;
 - A2. determining the number of effective base stations from predefined number of signals are received by the subscriber terminal by comparing the ratio of the highest peak power value from the order in step A1 to the subsequent peak power values with the given threshold.
3. A method as claimed in claim 2, wherein said signals are synchronous downlink pilot signals, and said step A1 further comprises steps:
 - A11. shift multiple correlating a local synchronous downlink pilot code and a received synchronous downlink pilot signal results in a power value of the synchronous downlink pilot signals received by the subscriber terminal ;

A12. determining peak power values corresponding to each of the synchronous downlink pilot codes.

4. A method as claimed in claim 3, wherein said method further comprises steps in between step A11 and step A12: selecting the power values of each frame of more than one frames and averaging said power values of each frame.

5. A method as claimed in claim 2, wherein said step A2 further comprises steps :

A21. numbering the peak power values ordered from the highest to the lowest and setting a current sequence number as predefined number of the base stations ;

A22. determining whether the highest peak power value and a peak power value corresponding to the current sequence number are greater than the given threshold, if so, setting the number of effective base stations from which the signals are received by a subscriber terminal as the value of the current sequence number, otherwise, the current sequence number decreases by one and returns back to step A22.

6. A method as claimed in claim 1, further comprises a step before said step A : reading vector data of 128 chips while receiving synchronous downlink pilot signals at the beginning of a downlink pilot time slot.

7. A method as claimed in claim 2, further comprises a step before said step B: multi-path combining signals of each base station.

8. A method as claimed in claim 7, wherein said step of multi-path combining signals of each base station comprises steps :

beginning from a point of previously predetermined number of the peak power value, reading data of synchronous downlink pilot signals at a point

which is 2 times of the predetermined value added length of said synchronous downlink pilot code;

performing Max Ratio Combination after eliminating phase difference between symbols of multi-path synchronous downlink pilot signal with different time delay and the phase difference of delay path.

9. A method as claimed in claim 1, wherein said step B of incorporating the signals of each station corresponding to the number of base stations is: to equal gain combining or weighting combining signals of each base station corresponding to said base station number to obtain an combined signal sequence.

10. A method as claimed in claim 9, wherein said step C is to obtain a rough estimating value of the carrier frequency offset according to the phase difference between two symbols spaced by a defined distant in said combined signal sequence.

11. A method as claimed in claim 10, wherein said step C further comprises: estimating carrier frequency offset for a predefined times, and then averaging them to get a carrier frequency offset estimation.

12. A method as claimed in claim 10, wherein said step C is to sum up the phase differences between two symbols spaced by a defined distant in said incorporated signal sequence, and then computing the phase angle to get the carrier frequency offset estimation.

13. A device for estimating carrier frequency offset, said device comprises at least:

a decision module for determining base station number from which signals are received by a subscriber terminal and a main path position of signal transmitted from each base station based on the signals received by a subscriber terminal, and then outputting the number of the effective base station and the main path position of each signal to an combining module ;

a combining module for combining the signals from each base station corresponding to the number of effective base stations based on the main path position of signals and then outputting the combined signals to a carrier frequency offset acquiring module;

a carrier frequency offset acquiring module for obtaining a rough estimating value of the carrier frequency offset based on the combined signals.

14. A device as claimed in claim 13, wherein said device further comprises a multi-path combining module for multi-path combining the signals of each base station, and then outputting the multi-path combined signal to the combining module, if the effective base station number is greater than 1.